



THE RISE OF ARTIFICIAL INTELLIGENCE

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THE INSTITUTE OF MATHEMATICS

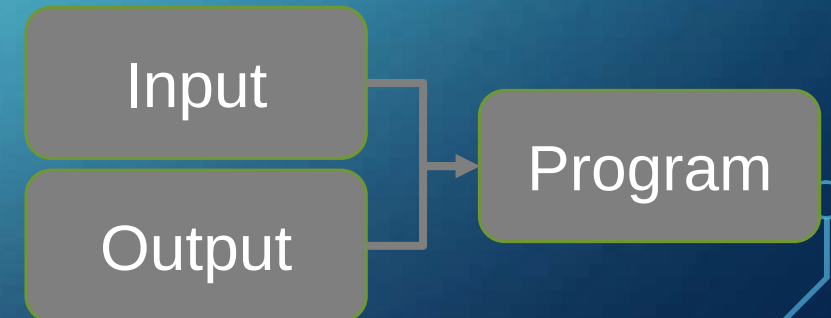
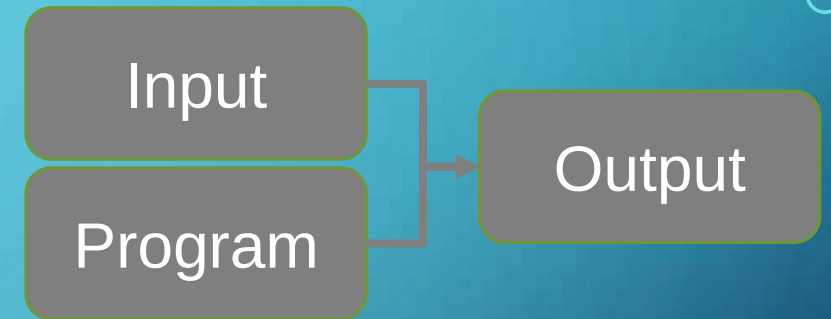
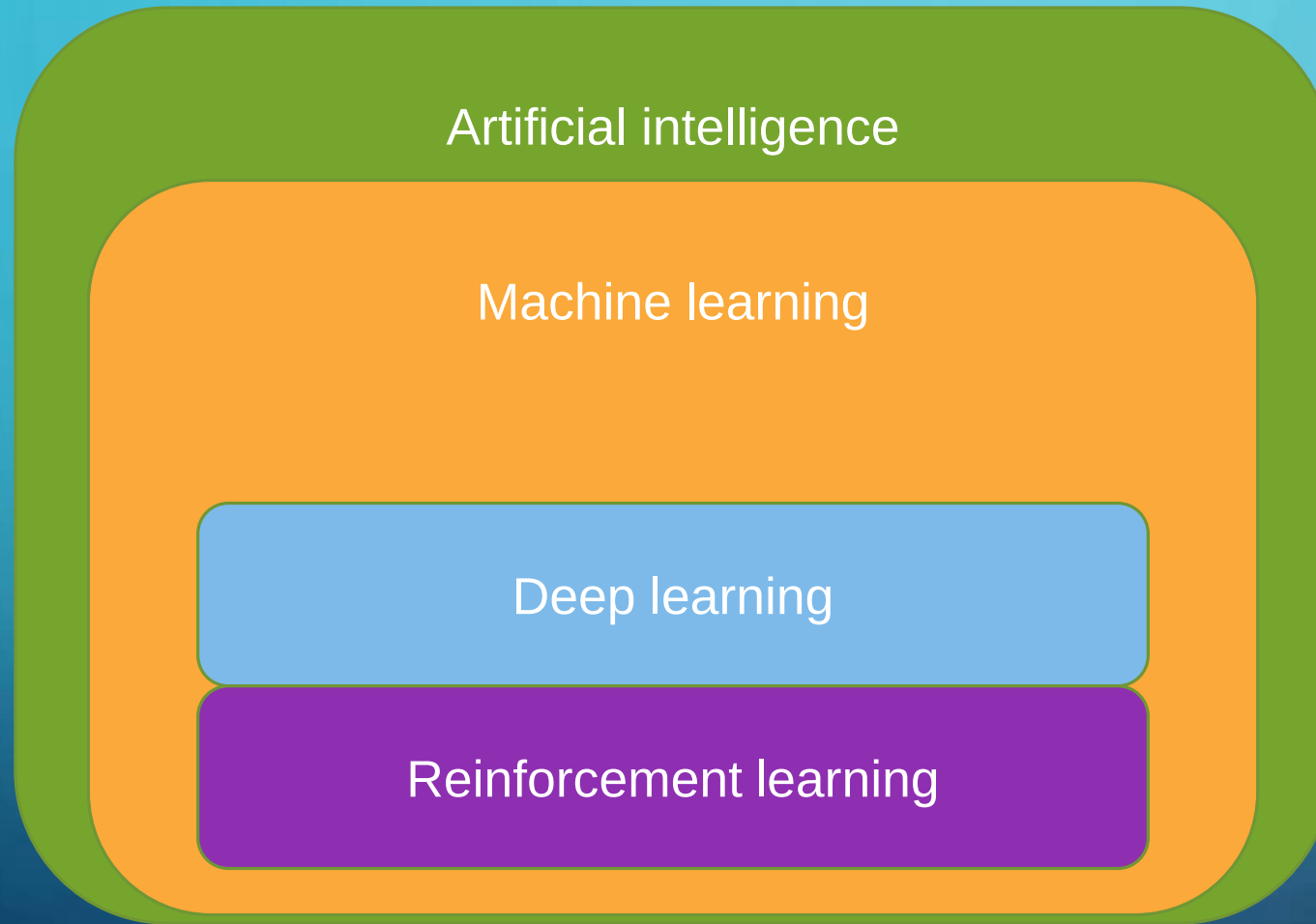
NATIONAL UNIVERSITY OF MONGOLIA

TODAI ROBOT



National Institute of Information, Japan

ARTIFICIAL INTELLIGENCE



RECOGNITION: MNIST (70K)



Input: picture of digit
Output: digit

Human error: 2.5%
Machine error: 0.7% (1998)
0.2% (2012)

<http://yann.lecun.com/exdb/mnist/>

RECOGNITION: 年賀状



RECOGNITION: IMAGENET (14M)



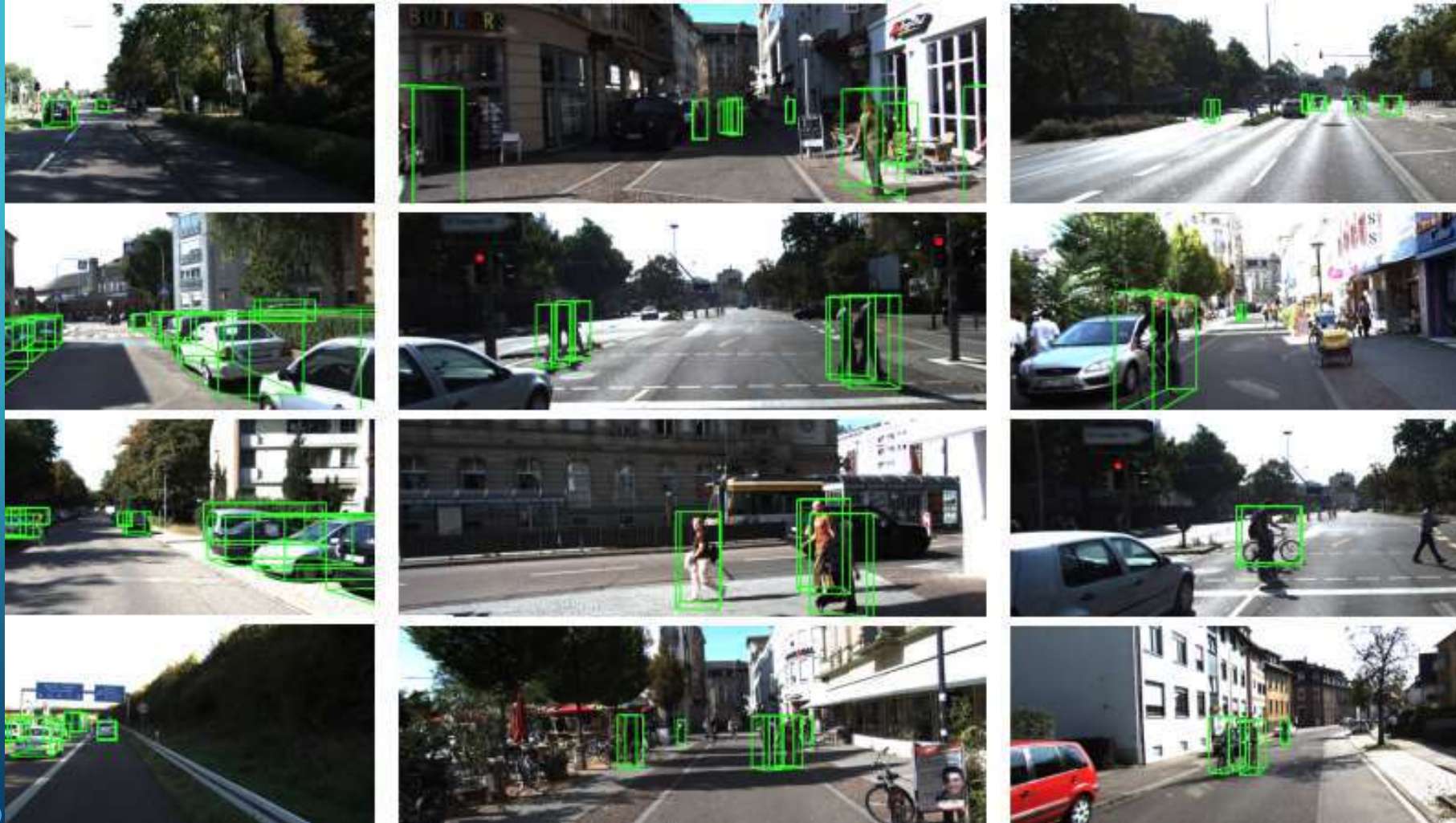
Input: image
Output: object

Human error: 5.0%

Machine error: 25% (2011)
16% (2012)
11% (2013)
3.5% (2015)
2.2% (2017)

<http://image-net.org/>

AUTONOMOUS DRIVING



Apple

AUTONOMOUS DRIVING

In order to make the automated driving system really effective, it should function not only in day time

GENERATION: HANDWRITING

Cause, baby, now we got bad blood
You know it used to be mad love
So take a look what you've done
Cause, baby, now we got bad blood
Hey, now we got problems
And I don't think we can solve them
You made a really deep cut
And, baby, now we got bad blood

GENERATION: SPEECH AND MUSIC



Connecative

Parametric

WaveNet

Piano

Deep Mind



DEEP LEARNING ULAANBAATAR 2018